BUREAU OF WATER

South Carolina Department of Health and Environmental Control

SHELLFISH MANAGEMENT AREA 15

2004 ANNUAL UPDATE

Shellfish Sanitation Program

Water Monitoring, Assessment and Protection Division
Environmental Quality Control - Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201

July 2004

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South Carolina Department of Health and Environmental Control

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2004 ANNUAL UPDATE

[Data Thru December 2003]

Shellfish Management Area 15
Shellfish Sanitation Program

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TABLE OF CONTENTS
Shellfish Management Area 15 Annual Update

FIGURES AND TABLES

Figures:

Tables:

ANNUAL UPDATE
Shellfish Management Area 15
SCDHEC EQC Bureau of Water

Data Inclusive Dates:
01/01/01 thru 12/31/03

Classification Change:
___ Yes __X__ No

Shoreline Survey Completed: Yes

Prior Report & Date: Annual -2003

(I)ncreased/(D)ecreased/(N)one:
__N__ Approved
__N__ Conditionally Approved
__N__ Restricted
__N__ Prohibited

SUMMARY

The majority of monitoring stations in Shellfish Management Area 15 exhibited slight to moderate increases in geometric mean and/or estimated 90th percentile MPN values subsequent to the previous three-year review period. These increase appear to reflect a return to normal rainfall amounts during 2002 and 2003 following the drought conditions the region experienced from 1999 to 2001. For this review period, a downward shift in water quality criteria (Approved to Restricted) occurred at one monitoring station in Area 15. Station 25 will, however, continue to be managed as Conditionally Approved. No change in the classification of Area 15 will be implemented.

During the 1997-1998 El Niño event, abnormally high rainfall and lower than normal salinities resulted in high fecal coliform bacteria concentrations in samples from Station 20 in Wallace Creek. Rainfall during January through March 1998 was triple, double, and one-and-half times normal rainfall, respectively. As a result of the inclusion of data collected during this period, water quality at Station 20 met Restricted area criteria in the 2000 Annual Update. To allow for better utilization of the shellfish resources, the Wallace Creek area was classified as Conditionally Approved in the 2000 Annual Update. Closure was based on rainfall greater than or equal to 1.20 inches in a 24-hour period.

Water quality at Station 20 met the statistical criteria for Restricted classification for the 2000 and 2001 Annual Updates. For the past three consecutive annual review periods, however, Station 20 has met the statistical criteria for an Approved classification. Currently, the geometric mean MPN value is 4.7 and the estimated 90th percentile MPN value is 18.

Statistical analysis of all routine samples collected at Station 20 for the past five years (1999 through 2003) indicates that the station meets Approved criteria. Further analysis was conducted on all routine samples collected at Station 20 for the last five years, **excluding those collected after rainfall greater than or equal to 1.40 inches (in a 24-hour period) on the sample date and up to 72 hours prior.** The geometric mean and estimated 90th percentile MPN values improved (lower values). The harvesting status of this station will remain Conditionally Approved; however, the rainfall closure criteria will be increased from 1.20 to 1.40 inches per 24-hours, as measured at the BJW&SA Southside WWTP.

A site on the Eastern shore of Battery Creek near shellfish monitoring Station 28 is being evaluated for contaminants of concern due to past mining operations. Although bacteriological water quality currently meets Approved area criteria, the area in the vicinity of Station 28 will retain a Restricted classification pending outcome of a site assessment and evaluation. Additionally, no relay or depuration activities will be permitted.

INTRODUCTION

PURPOSE AND SCOPE

The authority to regulate the harvest, sanitation, processing and handling of shellfish is granted to the South Carolina Department of Health and Environmental Control by Section 44-1-140 of the Code of Laws of South Carolina, 1976, as amended. The Department promulgated Regulation 61-47 which provides the rules used to implement this authority and outlines the requirements applied in regulating shellfish sanitation in the State This regulation specifically addresses classification of shellfish harvesting areas and requires that all areas be examined by sanitary and bacteriological surveys and classified into an appropriate shellfish harvesting classification.

The National Shellfish Sanitation Program (NSSP) Guide For The Control Of Molluscan Shellfish is used by the United States Food and Drug Administration (USFDA) to evaluate state shellfish sanitation programs. The NSSP Model Ordinance requires that a sanitary survey be in place for each growing area prior to its use as a source of shellfish for human consumption and prior to the area's classification as Approved, Conditionally Approved, Restricted, or Conditionally Restricted. Each sanitary survey shall be updated on an annual basis and accurately reflect changes which have occurred within the area. Requirement of the annual reevaluation include, at a minimum, field observations of pollution sources, an analysis of water quality data consisting of the past year's data in combination with appropriate previously collected data, review of reports and effluent samples from pollution sources, and review of performance standards for discharges impacting the growing area. A brief report documenting the findings shall also be provided.

The following criteria, consistent with the NSSP Model Ordinance and S. C. Regulation 61-47, are used in establishing shellfish harvesting classifications:

Approved - Growing areas shall be classified Approved when the sanitary survey concludes that fecal material, pathogenic microorganisms, and poisonous or deleterious substances are not present in concentrations which would render shellfish unsafe for human consumption. The Approved area classification shall be designated based upon a sanitary survey which includes water samples collected from stations in the designated area adjacent to actual or potential sources of pollution. For waters sampled under adverse pollution conditions, the median fecal coliform Most Probable Number (MPN) or the geometric mean MPN shall not exceed fourteen per one hundred milliliters, and not more than ten percent of the samples shall exceed a fecal coliform MPN of forty-three per one hundred milliliters (per five tube

decimal dilution). For waters sampled under a systematic random sampling plan, the geometric mean fecal coliform Most Probable Number (MPN) shall not exceed fourteen per one hundred milliliters, and the estimated ninetieth percentile shall not exceed an MPN of forty three (per five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using NSSP Guidelines.

Conditionally Approved - Growing areas may be classified Conditionally Approved when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff, discharge of a major river, or potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be adopted by the Department prior to classifying an area as Conditionally Approved. Where appropriate, the management plan for each Conditionally Approved area shall include performance standards for sources of controllable pollution, e.g., wastewater treatment and collection systems, evaluation of each source of pollution, and means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate.

Restricted - Growing areas shall be classified Restricted when sanitary survey data show a limited degree of pollution or the presence of deleterious or poisonous substances to a degree which may cause the water quality to fluctuate unpredictably or at such a frequency that a Conditionally Approved classification is not feasible. Shellfish may be harvested from areas classified as Restricted only for the purposes of relaying or depuration and only by special permit issued by the Department and under Department supervision. For Restricted areas to be utilized as a source of shellstock for depuration, or as source water for depuration, the fecal coliform geometric mean MPN of Restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters and not more than ten percent of the samples shall exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters and the estimated ninetieth percentile shall not exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using NSSP guidelines.

Conditionally Restricted - Growing areas may be classified Conditionally Restricted when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff, discharge of a major river, or potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be prepared by the Department prior to classifying an area as Conditionally Restricted. Where appropriate, the management plan for each Conditionally Restricted area shall include performance standards for sources of controllable pollution (e.g., wastewater treatment and collection systems and an evaluation of each source of pollution) and description of the means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate. Shellfish may be harvested from areas classified as Conditionally Restricted only for the purposes of relaying or depuration and only by permit issued by the Department and under Department supervision. For Conditionally Restricted areas to be utilized as a source of shellstock for depuration, the fecal coliform

geometric mean MPN of Conditionally Restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters and not more than ten percent of the samples shall exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters and the estimated ninetieth percentile shall not exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using NSSP guidelines.

Prohibited - Growing areas are classified Prohibited if there is no current sanitary survey or if the sanitary survey or monitoring data show unsafe levels of fecal material, pathogenic microorganisms, or poisonous or deleterious substances in the growing area or indicate that such substances could potentially reach quantities which could render shellfish unfit or unsafe for human consumption.

BACKGROUND INFORMATION

Shellfish Growing Area 15 consists of approximately 31,071 acres of shellfish growing area habitat located in Beaufort county. It consists of the Beaufort River and Brickyard Creek and their tributaries, including McCalley, Albergottie, Broomfield, Battery, Chowan, Ballast, Station, and Morse Island Creeks. The area's northern boundary is the northern shore of McCalleys Creek. The eastern boundary extends through Lady's Island to Highway 21, then to Morse Island Creek. The southern boundary is the Atlantic Ocean at the mouth of Port Royal Sound. The western boundary extends through Parris Island and follows the western shore of Battery Creek to the portion of McCalley Creek bordered by Highway 21.

The majority of the shellfish resource and harvesting activity is located in Chowan, Distant Island and Wallace Creeks.

The harvesting classifications of Area 15 prior to this survey were as follows:

Prohibited (Administrative closure):

1. Brickyard Creek, from its confluence with Mulligan Creek at Station 02, to its confluence with Beaufort River
2. Albergottie Creek, from its headwaters to its confluence with Brickyard Creek
3. Broomfield Creek, from its headwaters to its confluence with Beaufort River
4. Factory Creek, entire waterbody
5. Cat Island Creek, entire waterbody
6. Battery Creek and its tributaries, from Station 24 at the Highway 280 (Battery Creek) Bridge to its confluence with Beaufort River.
7. Archers Creek, from the boundary with Area 17 to its confluence with Beaufort River
8. Ballast Creek, from the boundary with Area 17 to its confluence with Beaufort River
9. McCalley Creek, from Station 15-01A to the headwaters
10. Battery Creek, from confluence with the Beaufort River to the southern Conditionally Approved boundary near Station 15-24.
11. Battery Creek Marina Closure Zone

Restricted:

1. Battery Creek, between Station 10 and the headwaters, excluding the Conditionally Approved Area.

Conditionally Approved:

1. Battery Creek, from Station 15-24 at the Hwy 280 (Battery Creek) Bridge to Station 15-21, (excluding all administratively Prohibited closure zones). The Conditionally Approved area also includes stations 10, 25, 26, 27. The portion of the main channel between stations 10 and 19 will be classified as Restricted.
2. Wallace Creek, the entire tributary, from its confluence with Chowan Creek at Station 15-18 to its headwaters.

Approved:

Remaining portions of Area 15.

Station Addition/Deactivation/Modification: None

The shellfish industry in South Carolina is based on the harvest of the eastern oyster (*Crassostrea virginica*) and hard clams (*Mercenaria mercenaria*). Areas in South Carolina designated for commercial harvest by the South Carolina Department of Natural Resources (SCDNR) include State shellfish grounds, Culture permits, and Kings Grant areas. Seven shellfish Culture Permit Areas are designated in Area 15. Culture Permit 097 and 114 are leased to L.P. Maggioni & Company, 119, 120, and 123 are leased to Dusenbury Seafood, and 90 is leased to Perry Hall. There currently is no leleaseholderor Culture Permit 80.

The public is allowed to harvest on four State Shellfish Grounds (S) and one Public Shellfish Ground (R) in Area 15. S-064 is located on Parris Island, S-094 in Morse Creek, S-118 in Wallace Creek and S-117 in Distant Island Creek. Recreational harvesting is allowed for clams and oysters in both areas, and commercial harvesting by licensed individuals is currently allowed on State Shellfish Grounds only, subject to seasons established by SCDNR. Recreational harvesting only is allowed on R-121 in Wallace (Capers) Creek.

Shellfish harvesting season in South Carolina extends from September 16 through May 15, although actual dates may vary. SCDNR has the authority to alter the shellfish-harvesting season for management purposes. The South Carolina Department of Health and Environmental Control has the authority to prohibit shellfish harvesting when necessary to ensure that all shellfish harvested in South Carolina waters are safe for human consumption.

POLLUTION SOURCE SURVEY

SURVEY PROCEDURES

Shoreline surveys of Area 15 were conducted by the Low Country District Shellfish Sanitation staff, by watercraft, vehicle, and on foot, during the survey period and are ongoing.

POINT SOURCE POLLUTION

Major sources of actual or potential pollution (see Figure 4):

Permitted Sources	Permit #/Type/ Discharge
Springs Ind/Wamchem NPL site	SC0046701/groundwater remed./McCalley Cr
Barnwell Resources	SC0046299/ groundwater remediation/ditch
USMC/ Beaufort Air Station WWTP	SC000825/0.75 MGD/pipe/Albergottie Cr.
Fast Fare	SC0046272/ groundwater remed./not built
O.C. Welch	SC0041726/ Oil/Water separator/ditch
City of Beaufort WWTP	SC0021016/2.0 MGD/diffuser/Beau. R.
BJW&SA / Shell Point WWTP	SC0042609/0.4 MGD/ diffuser/Beaufort River
USMC / Parris Is WWTP	SC0002577-001/3.0 MGD/pipe/ Beaufort River
USMC / Paris Is	SC0002577-003/boiler blowdown/ pipe /Beaufort River
Pleasant Point Plantation WWTP	ND0067393/ 0.1MGD/lagoon/ spray irrigation
Beachwood Mobile Home Park WWTP	ND0067091/0.04MGD/ spray field
Lady's Island Elementary School WWTP	ND0000574/ spray field- Tied into sewer
Cat Island	ND0073962/ tile field- Tied into sewer
Marsh Harbor Boatyard	Marina- No pumpout facilities
Downtown Beaufort Marina	Marina- Pumpout facilities
Ladies Island marina	Marina- No pumpout facilities
Port Royal Landing	Marina- Pumpout facilities

Permitted Sources	Permit #/Type/ Discharge
Battery Creek Marina	Marina- No pumpout facilities (dry stack marina)
S.C. Ports Authority Port Royal Terminal	Marina (cargo ship dock)
Port Royal Seafood	Marina (commercial shrimp dock)

A. **Municipal and Community Waste Treatment Facilities** - The USMC/ Parris Island WWTP (3.0 MGD) is the largest permitted discharge into Area 15. The plant discharges into the portion of the Beaufort River that is classified as SFH waters and its permitted fecal coliform limits are 14/43 colonies per 100 ml.

The City of Beaufort (2.0 MGD) and BJW&SA/Shell Point WWTP (0.4MGD) each discharge through separate diffusers located near the McTeer Bridge (Highway 802). This portion of the Beaufort River is classified as SA waters and the permitted fecal coliform limits are 200/400 colonies per 100 ml.

The USMC/ Beaufort Air Station (0.75 MGD) discharges into Albergottie Creek. Albergottie Creek is classified as SA waters and the permitted fecal coliform discharge limits are 200/400 colonies per 100 ml.

B. **Industrial Discharges** - A groundwater remediation system at the site of the former Springs Industries/Wamchem industrial site discharges into the headwaters of McCalley Creek. There is no sewage and therefore no fecal coliform bacteria component of the discharge. Prior to the 2001 Annual Update, the SCDHEC Division of Health Hazard Evaluation reviewed the list of chemicals of concern for the Wamchem site and indicated that portions of McCalley Creek might be opened to shellfish harvesting upstream of Station 15-33 (created 2002), which is approximately 1.3 miles downstream of the site. Monitoring at two other stations in McCalley Creek, 15-01 and 15-01A, has been performed since the 1980's and both stations have always met the statistical criteria for an Approved classification. Based upon this information, the Shellfish Sanitation Section concluded that little potential existed for adverse health affects associated with the groundwater remediation system discharge and the portion of McCalleys Creek between Station 15-01 and Station 15-01A was Approved in the 2001 Annual Update.

Other permitted industrial dischargers into waters of Area 15 include: Barnwell Resources which is a stormwater discharge from a construction and demolition (C&D) landfill; and O.C. Welch, which is an oil/water separator at a car dealership. In addition, the BJW&SA Shell Point WWTP has an approved pretreatment program and accepts some industrial wastes from businesses located in the Beaufort Industrial Park.

C. **Marinas** – S.C. Regulation 61-47, Shellfish defines *Marina* as "any water area with a structure (docks, basin, floating docks, etc.) which is: 1) used for docking or otherwise mooring vessels; and,

2) constructed to provide temporary or permanent docking space for more than ten boats, or has more than 200 linear feet of docking space." Currently, there are seven marina locations in Area 15. Port Royal Landing, Lady's Island Marina, and Downtown Beaufort Marina have marine sewage pump-out facilities. Battery Creek and Marsh Harbor Boatyard (both include dry stack storage) do not have pumpout facilities. Additionally, the S. C. Ports Authority, Port Royal Terminal, operates cargo ship docks and Port Royal Seafood operates a commercial shrimp dock. Both of these facilities are located on Battery Creek. A pump-out vessel has been permitted to operate at the Downtown Marina of Beaufort. There are numerous private boat docks throughout Area 15.

D. **Radionuclides** - Sources of radionuclides have not been identified within Area 15, and radionuclide monitoring has not been conducted. No other source of poisonous or deleterious substances has been identified within the area.

NONPOINT SOURCE POLLUTION

A. **Stormwater**- Stormwater runoff impacts water quality by transporting fecal coliform bacteria (and other pollutants) from land to the shellfish growing area.

Stormwater from roads, residences, and agricultural land is directed to the lowest point of elevation that is typically the nearest creek or marsh. In addition, there are freshwater wetland areas, ditches, and impoundments that drain into tidal creeks.

Beaufort County and its municipalities (Hilton Head, Port Royal, Bluffton, and the City of Beaufort) now have a Stormwater Utility. The utility is currently engaged in a rate study, mapping of drainage systems in the county, and water quality studies.

Widening of Highway 280, which runs parallel to the Western shore of Battery Creek, has been completed. The road was widened from two to five lanes (two travel lanes and a 15 foot wide paved median) and has curb and gutter. Five stormwater treatment devices designed to remove trash, sediment, and oil and grease from stormwater prior to discharge into Battery Creek are included in this project.

Most land disturbing activities in South Carolina must comply with the Stormwater Management and Sediment Reduction Act of 1991. The final regulations, effective on June 26, 1992, establish the procedures and minimum standards for a statewide stormwater management program. For activities in the eight coastal counties, additional water quality requirements are imposed. For all projects, regardless of size, which are located within one-half mile of a receiving water body in the coastal zone, the criteria for permanent water quality ponds having a permanent pool is that they are designed to store the first two inches of runoff from the entire site over a 24-hour period or storage of the first one inch of runoff from the built-upon portion of the property, whichever is greater. Storage may be accomplished through retention, detention, or infiltration systems, as appropriate for the specific site. In addition, for those projects that are located within1000 feet of shellfish beds, the first one and one half inches of runoff from the built-upon portion of the property must be

retained on site. Since 1992, these regulations have been applied to the development of residential subdivisions, golf courses, and business areas.

B. **Agricultural Waste** - During a shoreline survey of the Wallace Creek area, small herds of cattle were documented. These herds were located adjacent to ditches leading to Wallace Creek and thus pose a potential threat to water quality within the Wallace Creek growing area. Further monitoring and investigation of these areas is proposed.

C. **Individual Sewage Treatment and Disposal (ISTD) Systems** – Typically, older homes and businesses in Area 15 utilize ISTDs while the majority of new construction is serviced by central sewer collection and distribution systems. Picket Fences, adjacent to Battery Creek, initially permitted for 16 lots to use septic tanks, will convert to central sewer collection in approximately two years. Homes in more rural areas, such as those on St. Helena Island adjacent to Wallace Creek, utilize ISTDs.

D. **Wildlife and Domestic Animals** - This area supports populations of white-tailed deer, raccoons, wading birds, migratory waterfowl, and other wildlife, which may contribute to fecal coliform levels in some areas. Domestic animals present in the area include dogs, cats, horses, and goats. Large populations of ducks and geese, inhabiting numerous ponds and impoundments in the Area 15 management area, likely contribute to fecal coliform loading within the shellfish growing area.

E. **Boat Traffic** - The Atlantic Intracoastal Waterway (AIWW) begins at the Area 15 northern boundary at the confluence of Brickyard Creek and Coosaw River. The waterway extends through Beaufort River and Port Royal Sound and eventually reaches the area's southern boundary at Skull Creek at Hilton Head Island. Numerous commercial and recreational vessels utilize this North/South route. There are seven public boat landings in Area 15.

F. **Hydrographic and Habitat Modification** - Hydrographic and habitat modification in estuarine areas requires both State and Federal approval. Portions of the AIWW require maintenance dredging. The U.S. Army Corps of Engineers utilizes designated tracts of land adjacent to the AIWW as dredge spoil sites.

A new Chowan Creek bridge (Highway 21) will be longer and higher than the old bridge. The construction plans specify removal of some of the old earthen causeway. This should increase water flow through the area.

G. **Marine Biotoxins** - There have been no documented occurrences of toxic algae affecting water quality in Area 15. The Department participates in a State Task Force on toxic algae and maintains a toxic algae emergency response team.

HYDROGRAPHIC AND METEOROLOGICAL CHARACTERISTICS

PHYSIOGRAPHY

Area 15 is part of the Broad River estuary, which is a drowned river valley system and the largest of Sea Island Coastal Region estuaries (219 square kilometers). This estuary, which includes Broad River, Beaufort River, Port Royal Sound, and several tidal tributaries, includes an extensive system of marshes, tidal creeks, and sea-islands. The average depth of the estuary is approximately 7 meters at mid tide level. Broad deep natural channels exist throughout Port Royal Sound, Beaufort River, and major tidal tributaries. Large shoal areas occur primarily in the Beaufort River and Port Royal Sound. The AIWW (12 feet at MLW) is the only maintained navigational channel (NOAA, 1994).

A. **Tides** - Tides in Area 15 are semidiurnal, consisting of two low and high tides each lunar day. Mean tidal range within Port Royal Sound ranges from 6.15 feet. to 8.15 feet. Spring tidal range is between 7.13 feet and 9.45 feet (www.co-ops.nos.noaa.gov). The greatest tidal ranges of the year typically occur around full moon during the months of September through December. There is considerable variation in the normal tide range due to the prevailing strength and direction of winds.

B. **Rainfall** - Rainfall data used in this survey is collected at a weather station located at the Beaufort/Jasper Water & Sewer Authority Southside WWTP (station 380559- Beaufort 7 SW). The rainfall gauge is typically read at about 7:00 AM and the rainfall amount is recorded for that date. As most shellfish samples are collected after 7:00 AM, the rainfall for the sample date + 24 hours has been added to the rainfall summary table. Rainfall for the sample date + 24 hours may correlate better and help to explain elevated fecal coliform concentrations in sample results, particularly if there was zero rainfall on the date of or prior to sampling.

Annual rainfall is normally about 51.15 inches, with August being the wettest month. Charts showing monthly and yearly rainfall amounts for the years 1998 through 2003 are attached. Approximately 40% of the annual rainfall falls in the three-month period from June to August. Weather patterns during this time period are often characterized by thunderstorms and shower activity of a short duration. In addition, these three months also have the highest numbers of days with rainfall greater than one inch. The months of December through March historically have the greatest number of days with rainfall exceeding 0.10 inch and 0.50 inch. Rainfall events during these months are typically of a longer duration.

The effects of El Niño were first experienced as early as March of 1997, in the form of decreased rainfall. Rainfall amounts were below normal until mid-summer when the warm phase El Niño effects were observed in the form of above normal rainfall. The full influence of El Niño with regard to rainfall was observed in the fall, when amounts were recorded in excess of the 30-year average. This 'warm and wet' trend continued through April 1998. The 102-year (1895-1996) El Niño average rainfall for November to March for this region of S.C. is about 125% of the normal rainfall amount.

Annual rainfall recorded at the Beaufort 7SW weather station for 2000 and 2001 was significantly below the norm, as averaged over a 30-year period (see Chart Beaufort Annual Rainfall). Below normal rainfall continued through May 2002 and by August 2002, the drought status of all 46 counties in the state, including Beaufort and Colleton, had been upgraded to extreme. Above normal rainfall beginning in late August, however, led the S.C. Drought Response Committee to downgrade the drought status statewide and remove the drought declaration for Beaufort, Charleston, and Colleton counties on November 21, 2002.

C. **Winds** - The prevailing wind direction between February and September ranges between South and South Southwest (180 to 200 degrees) and between October and January is North Northeast (20 degrees). The annual mean wind speed is 8.5 MPH, with August having the lowest (7.3 MPH) and March the highest (10.0 MPH) mean wind speed.

D. **River discharges** - There are no freshwater rivers that discharge directly into Area 15. The salinity structure is primarily determined by the seasonal freshwater discharge from the Coosawhatchie River and mean salinities vary less than 5ppt between typical high and low salinity periods. The northern portion of Area 15 receives some freshwater inflow into Brickyard Creek from the Coosaw River.

WATER QUALITY STUDIES

DESCRIPTION OF THE PROGRAM

The Department currently utilizes a systematic random sampling (SRS) strategy within Area 15 in lieu of monitoring under adverse pollution conditions. In order to comply with NSSP guidelines, a minimum of thirty samples are required to be collected and analyzed from each station during the review period. Monitoring dates are computer generated prior to the beginning of each quarterly period thereby insuring random selection with respect to tidal stage and weather. Day of week selection criteria is limited to Mondays, Tuesdays, and Wednesdays due to shipping requirements and laboratory manpower constraints. Sample schedules are rarely altered.

During July 1998, an updated data analysis procedure was formalized. Samples utilized for classification purposes are limited to those samples collected in accordance with the SRS for a 36-month period beginning January 1 and ending December 31. This allows for a maximum of 36 samples per station yet provides a six-sample "cushion" (above the NSSP required 30 minimum) for broken samples, lab error, breakdowns, etc. This also allows each annual report to meet the NSSP Triennial Review monitoring criteria.

Seven hundred sixty-eight (768) surface water quality samples (<1.0 ft. deep) were collected for bacteriological analyses at 22 active water quality monitoring stations in Area 15 during the period 01/01/01 through 12/31/03.

Monitoring at Station 33, *McCalley Creek, 0.5 miles upstream of Station 15-01A*, was initiated in January 2002.

The samples were collected in 120 ml amber glass bottles, immediately placed on ice and transported by bus to the South Carolina Department of Health and Environmental Control's Trident District Environmental Quality Control laboratory at North Charleston, South Carolina or to the Low Country District laboratory in Beaufort. Upon receipt at the laboratory, sample sets that exceeded a 30-hour holding time or contained a temperature control > 10 degrees C. were discarded. Samples collected after September 1, 1986 have been analyzed using the five-tube/three dilution modified A-1 method described by Nuefeld (1985).

Surface water temperatures were measured utilizing hand-held, laboratory-quality calibrated centigrade thermometers. Salinity measurements were measured in the laboratory using automatic temperature compensated refractometers. Additional field data include ambient air temperature, wind direction, tidal stage and date and time of monitoring. Tidal stages were determined Nautical Software's Tides and Currents, Version 2 (1996).

MONITORING RESULTS

Stations 01, 01A, 02, 10, 15, 16, 17, 18, 19, 20, 21, 23, 24, 26, 27, 28, 29, and 30 meet the statistical criteria for an Approved classification. Stations 25, 31, and 32 exceeded a fecal coliform MPN geometric mean value of 14 or a fecal coliform MPN estimated 90th percentile value of 43, thus meeting the statistical criteria for a Restricted classification. Station 33 is a new station with 23 sample results for the review period. A total of 30 sample results are required for classification.

For the review period (January 1, 2001 through December 31, 2003), analysis of samples collected at each station in the Battery Creek and Wallace Creek Conditional Areas while in the open status indicates all stations meet the statistical criteria for an Approved classification (see data sheets-Conditional Area in Open Status).

CONCLUSIONS

Based on review of fecal coliform bacteriological data and the pollution source survey, Area 15 is impacted by two sources of actual or potential pollution.

NONPOINT SOURCE RUNOFF

Stormwater runoff appears to be the major source of fecal coliform bacteria contamination in Area 15. Elevated fecal coliform bacteria concentrations associated with stormwater runoff affects water quality at stations located in the headwaters of Wallace Creek and in tributaries of Battery Creek. The impact of rainfall and stormwater runoff on fecal coliform bacteria concentrations was particularly evident during the El Niño event between November, 1997 and April, 1998 when the area received

abnormally high rainfall. The resulting elevated fecal coliform bacteria concentrations had an impact also on shellfish harvesting classification for many stations.

Possible sources of fecal coliform bacteria contamination include failing septic systems, pets, domestic animals such as horses and cows, wildlife, and drainage from roads and freshwater wetlands.

INDIVIDUAL SEWAGE TREATMENT AND DISPOSAL SYSTEMS

Homes adjacent to shellfish waters in Area 15 are served by either ISTDs or central sewer. Homes in older developed areas utilize ISTDs while most new developments are tied into sewer. Soils in most areas are considered to be suitable for ISTDs and systems should operate properly if maintained. Older, unsound systems represent a potential source of fecal coliform contamination in the Battery Creek and Wallace Creek areas, particularly during periods of heavy rainfall.

RECOMMENDATIONS

All stations in the Battery Creek Conditional Management area except Station 25 currently meet the criteria for an Approved water quality classification. Water quality at Station 25 meets the statistical criteria for a Restricted water quality classification. However, for the review period (January 1, 2001 through December 31, 2003), analysis of samples collected at Station 25 while in the open status indicates the station meets the statistical criteria for an Approved classification (see data sheets-Conditional Area in Open Status). Therefore, the harvest classification of Station 25 will remain as Conditionally Approved.

During the 1997-1998 El Niño event, abnormally high rainfall and lower than normal salinities resulted in high fecal coliform bacteria concentrations in samples from Station 20 in Wallace Creek. Rainfall amounts during the January through March 1998 period were triple, double, and one-and-half times normal amounts, respectively. As a result, water quality at Station 20 exceeded Approved area criteria in the 2000 Annual Update. To allow for better utilization of the shellfish resources, the Wallace Creek area was classified as Conditionally Approved in the 2000 Annual Update. Closure was based on rainfall greater than or equal to 1.20 inches in a 24-hour period.

Water quality at Station 20 exceeded the statistical criteria for an Approved area classification for only the 2000 and 2001 Annual Updates. For the past three consecutive review periods (2002 through 2004), Station 20 has met the statistical criteria for an Approved classification. Currently, the geometric mean MPN value is 4.7 and the 90^{th} percentile MPN value is 18.

Staff from the Bureau of Land and Waste Management and Low Country District EQC has performed preliminary site assessments at two former superphosphate fertilizer- manufacturing sites adjacent to the Beaufort River and Battery Creek in Area 15. The contaminants of concern are Arsenic and Lead. The Beaufort River site is located within an existing Prohibited closure zone. The Battery Creek site is on the Eastern shore of Battery Creek near shellfish monitoring Station 28. For the review

period, water quality at stations 19, 28, 29, and 30 meets the criteria for an Approved classification. However, until the site assessment is completed, the classification is recommended to remain Restricted and no relay permits should be granted for Battery Creek.

Statistical analysis of all routine samples collected at Station 20 for the last five years (1999 through 2003) indicates that the station meets Approved area criteria. Further analysis was conducted of all routine samples collected at Station 20 for the last five years, **excluding those collected after rainfall greater than or equal to 1.40 inches (in a 24-hour period) on the sample date and up to 72 hours prior.** The geometric mean and estimated 90th percentile values improved (lower values). It is recommended that the harvesting status of this station remain Conditionally Approved, but the amount of rainfall required to close the area be increased from 1.20 to 1.40 inches in a 24-hour period, as measured at the BJW&SA Southside WWTP.

The shoreline survey and bacteriological data review of shellfish Management Area 15 indicates that no changes in classification boundary descriptions are necessary. Harvesting water classifications of Area 15 are recommended to remain the same as in the prior Annual Update. (see Figure 3):

Prohibited (Administrative closure):

1) Brickyard Creek, from its confluence with Mulligan Creek at Station 02, to its confluence with Beaufort River
2) Albergottie Creek, from its headwaters to its confluence with Brickyard Creek
3) Broomfield Creek, from its headwaters to its confluence with Beaufort River
4) Factory Creek, entire waterbody
5) Cat Island Creek, entire waterbody
6) Creek and its tributaries, from Station 24 at the Highway 280 (Battery Creek) bridge to its confluence with Beaufort River.
7) Archers Creek, from the boundary with Area 17 to its confluence with Beaufort River
8) Ballast Creek, from the boundary with Area 17 to its confluence with Beaufort River
9) McCalley Creek, from Station 15-01A to the headwaters
10) Battery Creek, from confluence with the Beaufort River to the southern Conditionally Approved boundary near Station 15-24.
11) Battery Creek Marina Closure Zone

Restricted:

1) Battery Creek, between Station 10 and the headwaters, excluding the Conditionally Approved Area.

Conditionally Approved:

1) Battery Creek, from Station 15-24 at the Hwy 280 (Battery Creek) bridge to Station 15-21, (excluding all administratively Prohibited closure zones) - The Conditionally Approved area also includes stations 10, 25, 26, 27. The portion of the main channel

between stations 10 and 19 will be classified as Restricted.

2) Wallace Creek, the entire tributary, from its confluence with Chowan Creek at Station 15-18 to its headwaters.

Approved:

Remaining portions of Area 15.

Station Addition/Deactivation/Modification: None

Analysis of monitoring data for Area 15 demonstrates the probability of a significant impact from rainfall exceeding 4.00" in a 24-hour period. Therefore, a precautionary closure of Area 15 will be implemented following rainfall events of greater than 4.00" in a 24-hour period, as measured at the Beaufort-7-SW Weather Station. This methodology is associated with the concept of the Probable Maximum Precipitation (PMP). PMP estimates for the coastal United States has been published in a series of hydro-meteorological reports (HMRs) by the National Weather Service (*National Weather Service*). PMP estimates for South Carolina's growing areas are derived from HMRs 51, 52, and 53 (*National Research Council, 1985*).

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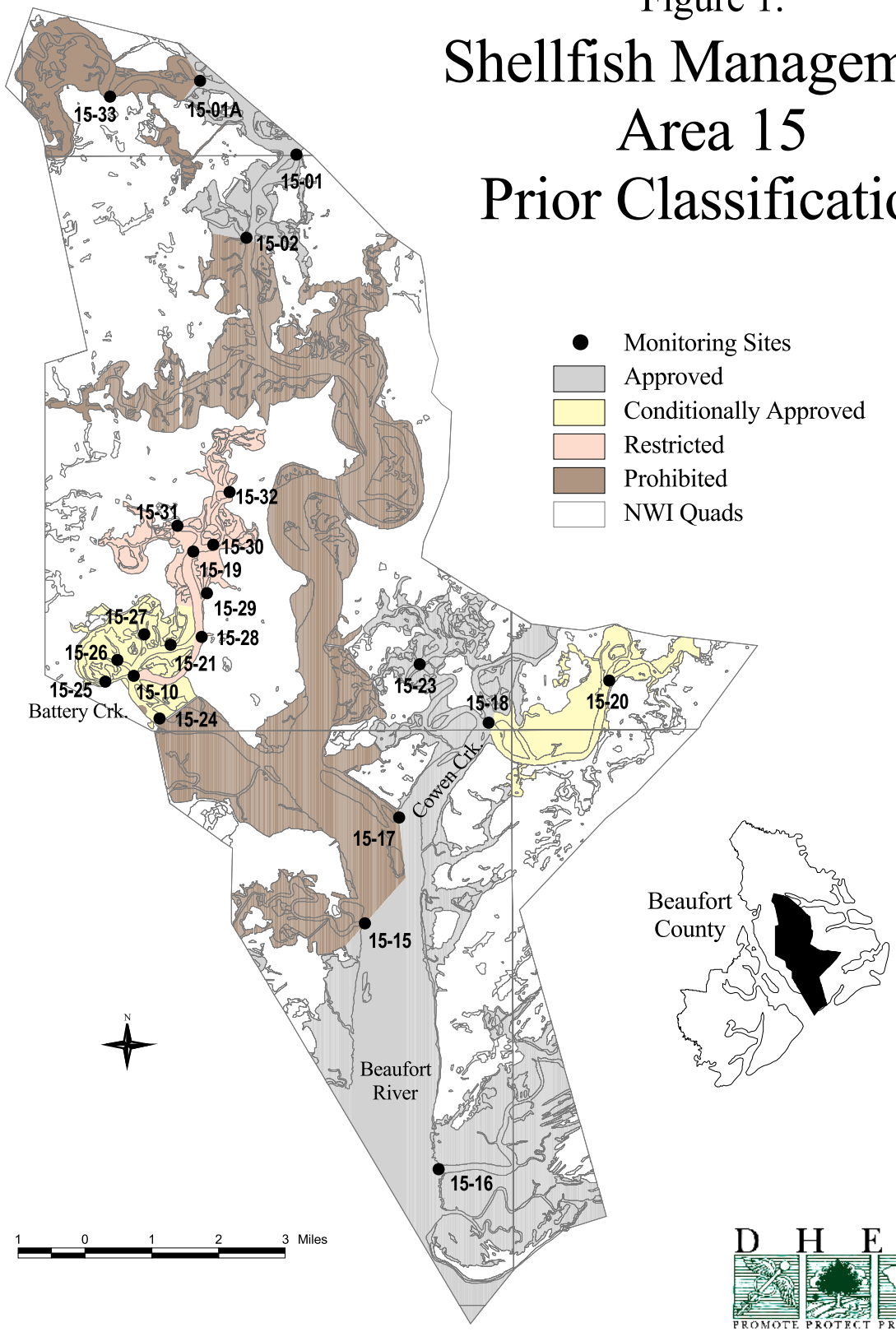
TABLE #1
Shellfish Management Area 15
WATER QUALITY MONITORING STATIONS DESCRIPTION

Station	Description
01	Brickyard Creek at Range Marker
01A	McCalleys Creek at Pawkie Island
02	Mulligan Creek at Brickyard Creek
10	Battery Creek at Five Points Creek
15	Ballast Creek at Beaufort River
16	Station Creek at Beaufort River
17	Cat Island Creek at Chowan Creek
18	Second Middle Marsh in Chowan Creek
19	Battery Creek 1000 feet below Rabbit Island
20	Capers Creek SSG at Penn Community Services Retreat Center
21	Unnamed creek at (former) discharge of BC High and Cherry Hill High
23	Distant Island State Shellfish Ground
24	Battery Creek - SC Highway 280 bridge
25	Battery Creek - Dowlingwood tributary
26	Battery Creek - Picket Fence tributary
27	Battery Creek - Cherry Hill tributary
28	Battery Creek - Storm water outfall under RR track
29	Battery Creek - Tributary on right side before Battery Shores
30	Battery Creek - Cottage Farms Community Dock
31	Battery Creek - Battery Point Community Dock
32	Battery Creek - Under power line
33	McCalley Creek, 0.5 miles upstream of station 15-01A

(Total 22 Active)

Figure 1.

Shellfish Management Area 15 Prior Classification



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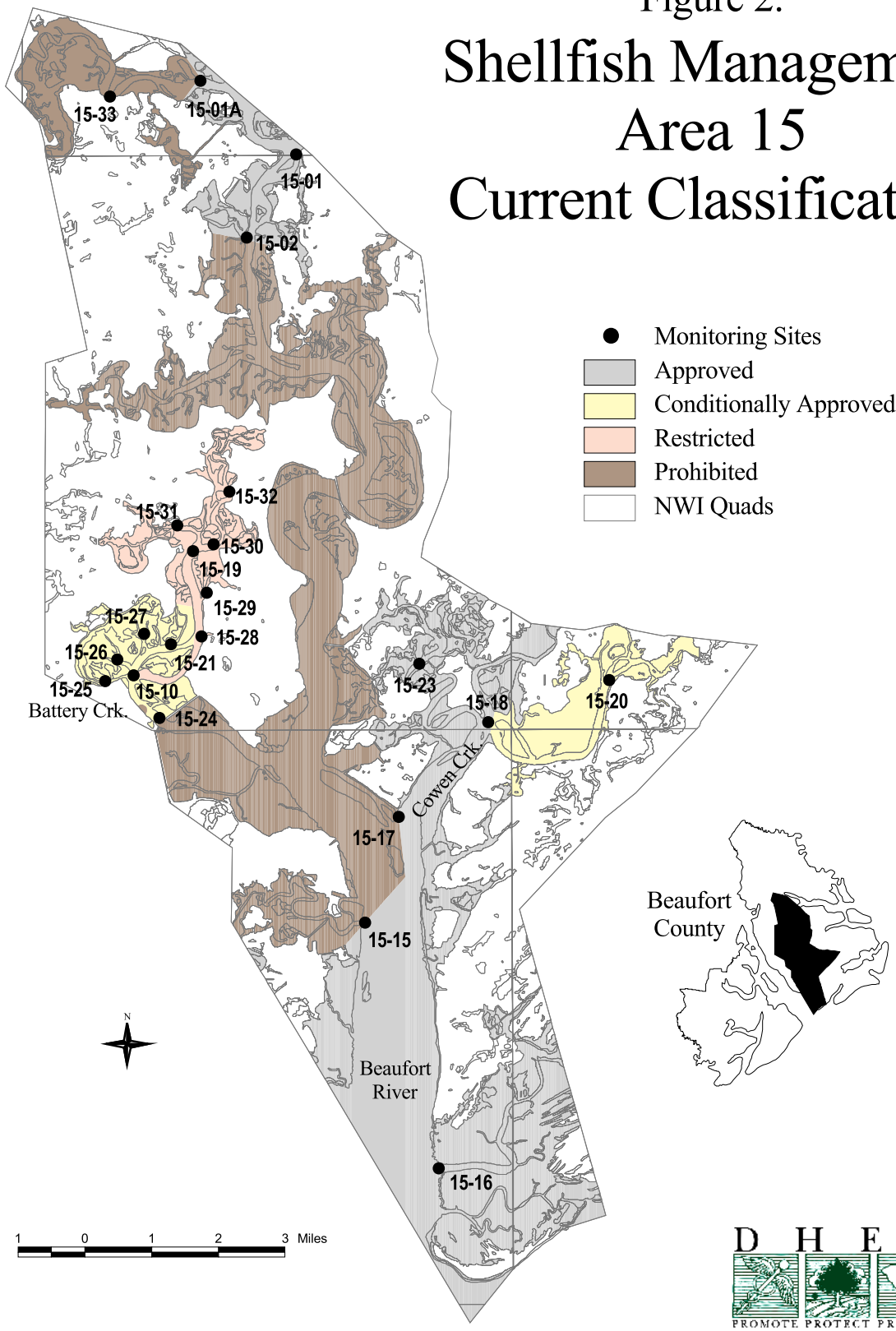
South Carolina Department of Health and Environmental Control

Figure 2.

Shellfish Management Area 15 Current Classification



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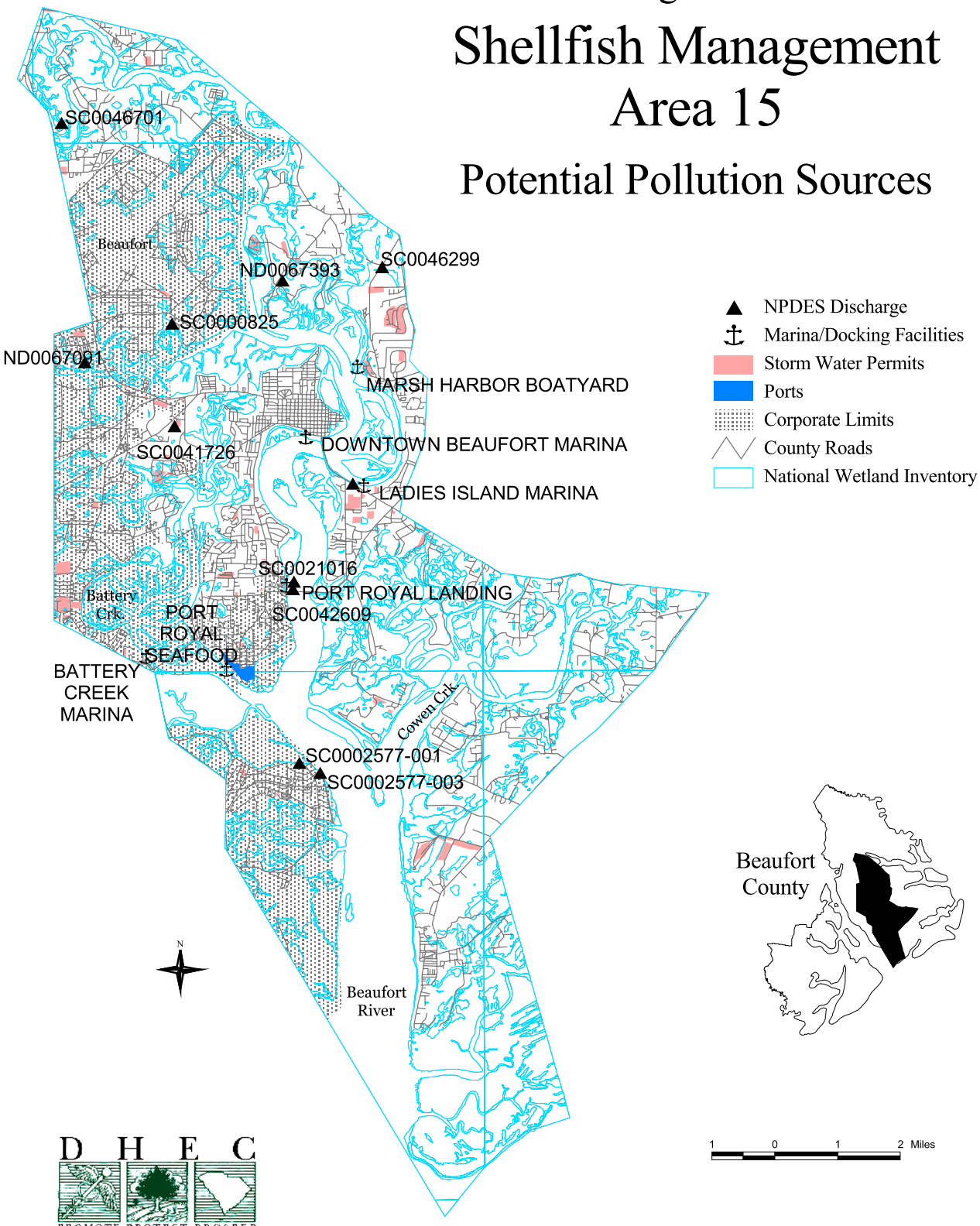
South Carolina Department of Health and Environmental Control

Figure 3.

Shellfish Management Area 15

Potential Pollution Sources



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South Carolina Department of Health and Environmental Control

TABLE #2 (A)
Shellfish Management Area 15
FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY
from Shellfish Water Quality Monitoring Stations between

January 1, 2001 and December 31, 2003

Station # º	1	1A	2	10	15	16	17	18	19	20	21
SAMPLES	36	35	30	36	36	36	35	35	36	35	36
GEOMEAN	3.6	4.4	7.0	4.5	3.4	2.1	2.7	3.7	5.3	4.7	6.2
90TH %ILE	11	10	26	12	9	2	5	20	23	18	21
WATER QLTY	A	A	A	A	A	A	A	A	A	A	A
CLASSIFICATION	A	A	P	CA	P	A	P	CA	R	CA	R

Station # º	23	24	25	26	27	28	29	30	31	32	33
SAMPLES	36	36	35	36	36	36	36	36	36	36	23
GEOMEAN	4.8	3.9	10.3	5.4	6.9	6.0	8.4	8.5	14.6	18.3	6.3
90TH %ILE	15	14	88	19	32	20	35	34	104	140	22
WATER QLTY	A	A	R	A	A	A	A	A	R	R	A
CLASSIFICATION	A	P	CA	CA	CA	R	R	R	R	R	New

Station # º											
SAMPLES											
GEOMEAN											
90TH %ILE											
WATER QLTY											
CLASSIFICATION											

A - Approved **CA** - Conditionally Approved **R** - Restricted
RND - Restricted/No Depuration **P** - Prohibited

TABLE #2 (B)
Shellfish Management Area 15

FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY

from Conditional Management Area Stations collected while in Open Status between January 1, 2001 and December 31, 2003

Station # °	*10	21	24	25	26	27		**18	20		
SAMPLES	19	19	19	19	19	19		19	19		
GEOMEAN	3.9	5.7	3.0	7.7	4.8	5.8		2.8	3.3		
90TH %ILE	9	19	6	35	14	16		5	10		
WATER QLTY	A	A	A	A	A	A		A	A		
CLASSIFICATION	CA	CA	CA	CA	CA	CA		CA	CA		

Station # °											
SAMPLES											
GEOMEAN											
90TH %ILE											
WATER QLTY											
CLASSIFICATION											

Station # °											
SAMPLES											
GEOMEAN											
90TH %ILE											
WATER QLTY											
CLASSIFICATION											

**** Battery Creek Conditional Mgmt Area / ** Wallace Creek Conditional Mgmt Area***

A - Approved **CA** - Conditionally Approved **R** - Restricted

RND - Restricted/No Depuration **P** - Prohibited

TABLE #3

Water Quality
Monitoring Stations Data

Shellfish Management Area 15

BACTERIOLOGICAL DATA

Data for each shellfish station listed in this report's "Fecal Coliform Bacteriological Data Summary Table" and in other shellfish reports, can be obtained through South Carolina's Department of Health and Environmental Control - Freedom of Information office at the address below.

Freedom of Information
2600 Bull Street
Columbia, SC 29201

Any explanation or clarity needed on the report's content can be obtained by contacting the preparer(s), and/or reviewer(s) listed on the cover page.

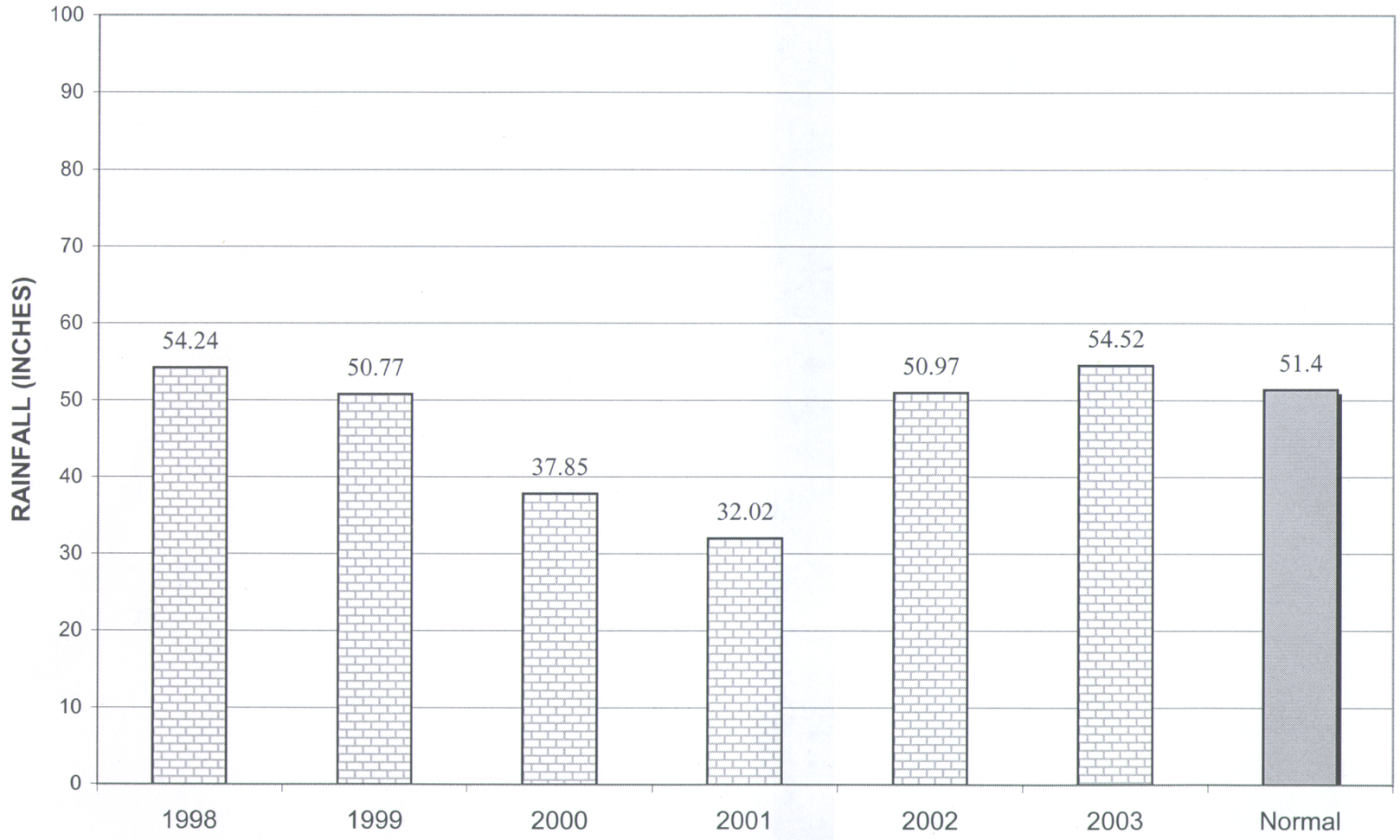
TABLE #4

Rainfall Data

Shellfish Management Area 15

SOURCE : NOAA/National Weather Service
National Climatic Data Center, Asheville, North Carolina 28801

BEAUFORT ANNUAL RAINFALL 1998-2003



ANNUAL TABLE OF DAILY RAINFALL DATA

SOURCE: City of Beaufort Wastewater Treatment Plant

Beaufort, SC (Station #380559 / 7-SW)

2001	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00
2nd	0.00	0.00	0.00	0.00	0.00	--	0.04	0.00	--	0.00	0.00	0.00
3rd	0.00	0.00	0.03	0.00	0.00	--	0.02	0.00	--	0.00	0.00	0.00
4th	0.00	0.18	0.85	0.04	0.00	0.41	0.42	0.00	0.75	0.00	0.00	0.00
5th	0.00	0.08	0.02	0.00	0.00	--	0.59	0.01	1.30	0.00	0.00	0.00
6th	0.00	0.00	0.00	0.00	0.00	--	0.00	0.10	0.13	0.00	0.00	0.00
7th	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.23	0.25	0.00	0.00
8th	0.02	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.23	0.00	0.00	0.00
9th	0.31	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.02	0.00	0.00	0.48
10th	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.02	0.05	0.00	--	0.00
11th	0.00	0.06	0.00	0.00	0.00	0.05	0.00	--	0.00	0.00	--	0.63
12th	0.10	0.70	0.00	0.00	0.00	1.30	0.00	0.00	0.05	0.02	0.00	0.06
13th	0.09	0.06	0.77	0.00	0.00	--	1.06	1.58	0.00	--	0.00	0.00
14th	0.00	0.02	0.00	0.20	0.00	0.20	0.28	0.66	0.00	--	0.00	0.00
15th	0.00	0.00	0.15	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	--
16th	0.00	0.00	0.80	0.20	0.00	--	0.00	0.00	0.00	0.00	0.00	--
17th	0.00	0.11	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	--	0.00
18th	0.03	0.00	0.00	0.00	0.00	0.04	0.00	2.37	0.00	0.00	--	0.07
19th	0.00	0.00	0.00	0.00	0.00	--	0.00	2.30	0.00	0.00	0.00	0.00
20th	0.45	0.00	1.05	0.00	0.00	0.22	0.00	0.45	0.00	--	0.00	0.00
21st	0.00	0.00	0.51	0.00	0.00	0.11	--	1.02	0.00	--	0.00	0.00
22nd	0.00	0.03	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00
23rd	0.00	0.35	0.00	0.00	0.05	0.04	0.03	0.00	--	0.00	--	0.00
24th	0.00	0.00	0.00	0.00	0.00	0.05	1.00	0.00	0.04	0.00	0.00	0.02
25th	0.00	0.00	0.01	0.00	0.00	--	1.10	0.00	0.90	0.00	0.03	0.00
26th	0.00	0.06	0.00	0.27	0.00	0.28	0.03	0.00	0.01	0.00	0.00	0.00
27th	0.00	0.00	0.00	0.00	0.00	0.28	0.08	0.00	0.00	0.00	0.00	0.00
28th	0.00	0.01	0.00	0.00	0.00	0.01	--	0.00	0.00	--	--	0.00
29th	0.00		0.21	0.00	0.00		--	0.00	0.00	0.00	0.00	0.00
30th	0.00		0.95	0.00	0.40		0.00	0.02	0.00	0.00	0.00	0.00
31st	0.80		0.03		0.00		0.00			0.00		0.00
(Monthly Figures)									**Year's Rainfall Total:**		**32.02**	
SUM	1.80	1.66	5.38	0.71	0.45	3.57	4.65	8.53	3.71	0.27	0.03	1.26
MAX	0.80	0.70	1.05	0.27	0.40	1.30	1.10	2.37	1.30	0.25	0.03	0.63
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG	0.06	0.06	0.17	0.02	0.01	0.22	0.17	0.29	0.15	0.01	0.00	0.04

Note:"--" denotes missing data

(Shellfish Management Areas 14, 15, 16A, 16B, 17, 18, 19)

ANNUAL TABLE OF DAILY RAINFALL DATA

SOURCE: City of Beaufort Wastewater Treatment Plant

Beaufort, SC (Station #380559 / 7-SW)

2002	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	0.00	0.00	0.00	2.60	0.00	0.00	--	0.81	0.65	0.05	0.00	0.00
2nd	0.10	0.00	--	0.00	0.00	0.00	0.00	0.02	0.06	0.15	0.00	0.00
3rd	0.50	--	--	0.00	0.00	0.00	0.00	--	0.16	0.00	0.00	0.00
4th	0.08	0.00	0.05	0.00	--	0.00	0.00	0.02	0.00	--	0.00	0.00
5th	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.25	0.00
6th	--	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.78	0.13
7th	0.00	1.01	0.00	0.00	0.00	0.00	--	0.49	0.00	0.02	0.04	--
8th	0.00	0.25	0.00	0.02	--	0.00	0.00	0.00	0.00	0.00	0.00	--
9th	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
10th	0.00	0.27	0.00	0.41	0.00	0.00	0.28	0.00	--	1.85	1.12	0.73
11th	0.00	0.15	0.00	0.04	0.00	0.00	0.00	0.00	0.00	--	0.00	0.35
12th	0.00	0.00	0.00	--	0.00	0.00	2.16	0.00	0.00	0.04	1.20	0.04
13th	--	0.00	0.35	0.00	0.00	0.00	--	0.00	--	0.04	0.89	0.56
14th	0.00	0.00	0.00	0.00	0.11	0.00	0.60	0.07	0.90	0.05	0.00	0.03
15th	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.02	0.00	0.00
16th	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17th	0.00	--	--	0.00	0.00	--	0.00	--	0.00	0.00	1.59	0.00
18th	0.00	0.00	0.03	0.00	0.00	0.02	0.00	0.25	0.22	0.00	0.03	0.00
19th	--	0.00	0.00	0.00	1.10	0.63	0.00	0.02	0.16	0.00	0.00	0.04
20th	--	0.00	0.00	0.00	0.00	3.85	--	0.00	0.11	0.00	0.00	0.20
21st	0.00	0.21	0.18	0.00	0.00	1.21	1.97	0.00	0.00	0.00	0.00	0.02
22nd	0.10	0.00	0.20	0.00	--	0.01	0.00	0.00	0.58	0.00	0.09	0.00
23rd	0.01	0.01	0.00	0.00	0.00	0.76	0.85	0.00	1.20	0.00	0.00	0.00
24th	0.00	0.04	--	0.00	0.00	0.92	0.01	0.04	0.00	0.09	0.00	0.08
25th	0.01	0.00	0.00	0.00	--	0.78	0.60	0.84	0.84	0.09	0.00	1.33
26th	0.14	0.00	0.00	--	0.00	0.01	0.00	0.30	0.51	0.00	0.00	0.00
27th	0.00	0.00	0.48	--	0.00	0.00	0.00	--	--	0.00	0.00	0.00
28th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	0.49	0.00	0.00
29th	0.00		0.00	0.00	0.00		0.00	2.23	2.05	0.38	0.00	0.00
30th	0.00		0.00		0.00		0.00	1.50		0.00	0.00	0.00
31st	0.00		--		0.00		0.00					0.00
(Monthly Figures)									**Year's Rainfall Total:**		**50.97**	
SUM	1.34	1.96	1.29	3.14	1.21	8.19	6.48	6.59	8.00	3.27	5.99	3.51
MAX	0.50	1.01	0.48	2.60	1.10	3.85	2.16	2.23	2.05	1.85	1.59	1.33
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG	0.05	0.08	0.05	0.12	0.04	0.30	0.24	0.26	0.32	0.12	0.20	0.13

Note:"--" denotes missing data

(Shellfish Management Areas 14, 15, 16A, 16B, 17, 18, 19)

ANNUAL TABLE OF DAILY RAINFALL DATA

SOURCE: City of Beaufort Wastewater Treatment Plant

Beaufort, SC (Station #380559 / 7-SW)

2003	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	0.32	0.00	0.00	0.00	0.00	1.00	0.02	0.00	0.22	0.00	0.00	0.00
2nd	0.00	0.00	0.47	0.00	0.00	0.00	0.61	0.14	0.00	0.00	0.00	0.00
3rd	0.00	0.00	0.01	0.00	0.10	0.00	0.84	0.00	0.00	0.00	0.00	0.00
4th	0.00	0.02	0.33	0.00	0.03	0.86	0.00	0.00	0.03	0.00	0.06	0.47
5th	0.00	0.03	0.08	0.00	0.00	0.51	0.03	0.56	0.02	0.00	0.05	0.44
6th	0.00	0.00	0.02	0.03	0.00	0.00	0.01	0.00	2.10	0.00	0.00	0.00
7th	0.00	0.42	1.04	0.09	0.43	0.16	0.00	0.30	0.15	0.01	0.00	0.00
8th	0.00	0.03	0.55	0.96	0.00	0.70	0.05	0.00	0.27	0.02	0.00	0.00
9th	0.00	0.00	0.02	1.26	0.00	0.36	0.00	0.00	0.15	0.07	0.00	0.00
10th	0.00	0.12	0.01	0.72	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00
11th	0.00	0.31	0.00	0.15	0.00	0.00	0.00	0.02	0.00	0.02	0.00	--
12th	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13th	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00
14th	0.00	0.00	0.56	0.00	0.00	0.66	0.11	0.00	0.00	0.00	0.00	0.33
15th	0.00	0.00	0.21	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00
16th	0.00	0.00	0.15	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17th	0.00	1.40	0.02	0.00	0.12	0.25	0.00	0.08	0.00	0.00	0.00	0.02
18th	0.00	0.05	0.38	0.00	1.92	0.26	0.00	0.36	0.00	0.07	0.00	0.00
19th	0.00	0.00	0.10	0.00	2.80	1.14	0.00	2.42	0.00	0.00	0.00	0.00
20th	0.00	0.00	0.11	0.00	0.00	0.00	3.95	0.00	0.00	0.00	0.36	0.00
21st	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00
22nd	0.03	0.02	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23rd	0.23	0.58	0.00	0.00	3.01	0.00	0.00	0.00	0.25	0.00	0.00	0.00
24th	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.05	0.00	0.00	0.04
25th	0.00	0.00	0.00	0.00	0.04	0.00	1.29	0.16	0.00	0.00	0.00	0.00
26th	0.00	0.00	0.00	1.34	0.16	0.00	0.62	0.51	0.00	0.00	0.00	0.00
27th	0.00	0.45	0.00	0.46	0.11	0.00	0.20	0.03	0.00	0.00	0.00	0.00
28th	0.00	0.09	0.01	0.00	0.00	0.00	0.63	0.00	0.00	0.25	0.00	0.00
29th	0.00		0.00	0.00	0.00	1.00	0.36	0.00	0.00	2.60	0.21	0.00
30th	0.00		0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00
31st	0.00		0.30		0.00		0.00	0.00		0.00		0.00
(Monthly Figures)									**Year's Rainfall Total:**		**54.52**	
SUM	0.58	3.52	4.75	5.08	9.00	7.05	11.17	5.07	3.28	3.04	0.68	1.30
MAX	0.32	1.40	1.04	1.34	3.01	1.14	3.95	2.42	2.10	2.60	0.36	0.47
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG	0.02	0.13	0.15	0.17	0.29	0.24	0.36	0.16	0.11	0.10	0.02	0.04

Note:"--" denotes missing data

(Shellfish Management Areas 14, 15, 16A, 16B, 17, 18, 19)

TABLE #4

Shellfish Management Area 15

A SUMMARY OF RAINFALL

During and Prior To Fecal Coliform Monitoring

Sample Date	Sample Date + 24 hours	Sample Date	Sample Date - 24 hours	Sample Date - 48 hours	Sample Date - 72 hours
01/09/01	0.00"	0.31"	0.02"	0.00"	0.00"
02/12/01	0.06"	0.70"	0.06"	0.00"	0.00"
03/12/01	0.77"	0.00"	0.00"	0.00"	0.00"
04/17/01	0.00"	0.00"	0.20"	0.00"	0.20"
05/09/01	0.00"	0.00"	0.00"	0.00"	0.00"
06/05/01	no data	no data	0.41"	no data	no data
07/09/01	0.00"	0.00"	0.00"	0.00"	0.00"
08/13/01	1.58"	0.00"	no data	0.02"	0.00"
09/17/01	0.00"	0.00"	0.00"	0.00"	0.00"
10/10/01	0.00"	0.00"	0.00"	0.00"	0.25"
11/28/01	0.00"	no data	0.00"	0.00"	0.03"
12/12/01	0.00"	0.06"	0.63"	0.00"	0.48"
01/14/02	0.4	0.00	no data	0.00	0.00
02/20/02	0.21	0.00	0.00	0.00	no data
03/04/02	0.00	0.05	no data	no data	0.
04/10/02	0.41	0.07	0.02	0.00	0.00
05/15/02	0.00	0.00	0.11	0.00	0.00
06/05/02	0.00	0.00	0.00	0.00	0.00
07/23/02	0.01	0.85	0.00	1.97	no data
08/14/02	0.00	0.07	0.00	0.00	0.00
09/04/02	0.00	0.00	0.16	0.06	0.65
10/21/02	0.00	0.00	0.00	0.00	0.00
11/19/02	0.00	0.00	0.03	1.59	0.00
12/02/02	0.00	0.00	0.00	0.00	0.00
01/27/03	0.00	0.00	0.00	0.00	0.00
02/13/03	0.00	0.00	0.00	0.31”	0.12”
03/04/03	0.08”	0.33”	0.01”	0.47”	0.00”
04/01/03	0.00”	0.00”	0.30”	0.00”	0.00”
05/05/03	0.00”	0.00”	0.03”	0.01”	0.00”
06/11/03	0.00”	0.00”	0.00”	0.36”	0.70”
07/22/03	0.00”	0.00”	0.00”	3.95”	0.00”
08/06/03	0.30”	0.00”	0.56”	0.00”	0.00”
09/24/03	0.00”	0.05”	0.25”	0.00”	0.00”
10/07/03	0.02”	0.01”	0.00”	0.00”	0.00”
11/18/03	0.00	0.00	0.00	0.00	0.00
12/01/03	0.00	0.00	0.00	0.21”	0.00

Amounts Shown Are per Day, not Cumulative / Station 380559 - Beaufort 7 - SW

Management Plan for Conditionally Approved Areas

Shellfish Management Area 15

Shellfish Management Area 15
WALLACE CREEK
CONDITIONAL AREA MANAGEMENT PLAN

July 2004

I. AREA DESCRIPTION

The 2004 Annual Update includes the following written description of Wallace Creek's Conditionally Approved areas, in addition to a prior and a current classification map reflecting the Conditionally Approved area boundaries.

> *Wallace Creek, the entire tributary, from its confluence with Chowan Creek at Station 15-18 to its headwaters.*

The majority of Wallace Creek is a State Shellfish Ground (S-118), however, there is also a Recreational Shellfish Ground (R-121) near its confluence with Chowan Creek and a Culture Permit (C-119) in the headwaters area.

During the late 1990's El Niño event, abnormally high rainfall and lower than normal salinities resulted in high fecal coliform bacteria concentrations in samples from Station 20 in Wallace Creek. Rainfall amounts during the January through March 1998 period were triple, double, and one-and-half times the normal (yearly average for a 30-year period) amounts, respectively. As a result, water quality at Station 20 met the Restricted criteria in the 2000 Annual Update. To allow for better utilization of the shellfish resources, the Wallace Creek area was classified as Conditionally Approved in the 2000 Annual Update. Closure was based on rainfall greater than or equal to 1.20 inches in a 24-hour period.

Water quality at Station 20 met the statistical criteria for Restricted classification for only the 2000 and 2001 Annual Updates. Station 20 has met the statistical criteria for Approved classification for the last three consecutive Annual Updates (2002 through 2004). Currently, the geometric mean MPN value is 4.7 and the 90^{th} percentile MPN value is 18.

Statistical analysis of all routine samples collected at Station 20 for the last five years (1999 through 2003) indicates that the station meets Approved criteria. Further analysis was conducted of all routine samples collected at Station 20 for the last five years, **excluding those collected after rainfall greater than or equal to 1.40 inches (in a 24-hour period) on the sample date to 72 hours prior.** The geometric mean and 90^{th} percentile values improved (lower values). The harvesting status of this station will remain Conditionally Approved, but the amount of rainfall required to close the area will be increased from 1.20 to 1.40 inches in a 24-hour period, as measured at the BJW&SA Southside WWTP.

There are no mariculture operations in the area; therefore year round harvesting is not allowed. The harvesting season is from September 16 through May 14.

II. FACTORS INDICATING SUITABILITY OF WALLACE CREEK AS A CONDITIONALLY APPROVED AREA

B. The major pollution source adversely affecting water quality in Wallace Creek is nonpoint source in origin.

C. Wallace Creek receives no substantial freshwater input other than from rainfall and associated runoff.

D. Wallace Creek has a tidal range that facilitates sufficient exchange with coastal ocean waters. This exchange results in a typical salinity range of 20 ppt to 28 ppt. Depressed salinities due to rainfall are temporary.

E. Wallace Creek is relatively small geographically and does not present major patrol difficulties.

III. PREDICTABLE POLLUTION EVENTS THAT CAUSE CLOSURE

A. Meteorological Events

1. The Wallace Creek Conditionally Approved area will be closed upon receipt of 1.40" or more of rainfall, as measured at weather station 380559- Beaufort 7 SW, located at the BJW&SA Southside WWTP.

2. Analysis of data excluding samples taken following rainfall events of 1.40” or more in a 24-hour period collected during the shellfish harvesting season (September through May), indicates that Station 20 will meet the statistical criteria for an Approved classification. This supports management of this area based upon rainfall of 1.40” or more in a 24-hour period. (See data summary table below).

FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY
from Conditional Management Area Stations
collected while in Conditional Area Open (CAO) status
between
January 1, 2001 and December 31, 2003

Station # º	20
SAMPLES	19
GEOMEAN	3.3
90TH %ILE	10
WATER QLTY	A
CLASSIFICATION	CA

2. A review of rainfall data for the past five years (1999 to 2003) indicates that the area will receive an average of 2.2 rainfall events per year equal to or greater than 1.40". Although some events are likely to crossover, each event is considered to be separated from the subsequent event by a minimum duration of 14 days. With this in mind, one could expect the Conditionally Approved area in Wallace Creek to remain in an open status 87.3% (211 days) of the harvest season (September 16 through May 15; a total of 242 days).

Number of 24- hour Rainfall events > 1.40 inches Sept. 16 to May 15

1999	2
2000	3
2001	0
2002	4
2003	2
Total	11 / 5yrs = 2.2 days/yr.

2.2 x 14 day closure = 30.8 days closed/yr.

(30.8 / 242 days in harvest season= 12.7% closed, 87.3% open)

B. **Seasonal Events**

Any significant input from migratory waterfowl populations is offset by tidal flushing.

IV. IMPLEMENTATION OF A CONDITIONAL AREA CLOSURE

The Low Country EQC District Shellfish Sanitation Program manager is the responsible party for determining compliance with all aspects of this plan, including the tracking of rainfall criteria violations. In the event that the manager shall be unavailable, a responsible employee shall be designated responsibility for tracking, compliance, and notification procedures.

A. **Implementation of Closure (September through May):** The following procedures shall be used in the event a closure is necessary:

1. The State Shellfish Sanitation Program Manager (or his designee) shall be notified upon determination of the need for any closure. Media notification shall be coordinated through the Shellfish Sanitation Program and the Office of Media

Relations.

2. The Office of Media Relations (Media Relations) is the responsible authority for issuance of news releases. Media Relations shall be notified within four hours of the determination of the need for a closure. They shall be provided with specific information regarding the pollution event and affected area. In the event of the need for a weekend or holiday closure, Media Relations shall be contacted through their on-call pager number or through the Department's emergency response telephone number.

3. Within four hours of a determination of the need for a closure, District Shellfish staff shall notify the South Carolina Department of Natural Resources (SCDNR), Office of Commercial Fisheries Management, & SCDNR Law Enforcement, by telephone and/or fax.

4. District Shellfish Sanitation Program staff shall notify certified Shellfish Shippers with interests in the affected area. SCDNR is the State agency having authority for the issuance of individual commercial shellfish harvest permits and should provide notification to individual permittees.

5. Prior to September 16, SCDHEC shall post an adequate number of "Warning Conditional Area" signs throughout the area. Additionally, maps indicating the current condition of the affected area will be posted at locations adjacent to the area suitable for public information display. Map postings shall take place immediately following issuance of the draft news release.

6. During the closure period, District Shellfish Sanitation Program officers shall insure patrols are conducted at a frequency sufficient to deter illegal harvest activities. Schedules shall include night and weekend patrols. Documentation of these patrols shall be maintained. Unless a district Shellfish Sanitation Program officer has personal knowledge that a violator has been notified of the closure, under no circumstance shall a summons be issued during the first 48 hours following the initial call to Media Relations. Written warnings should be issued during this 48 hour period and all shellfish should be returned to the water.

B. **Management of Conditional Areas Extraneous to the Normal Shellfish Harvest Season**

The Wallace Creek Conditionally Approved area shall remain in the closed status from May 16 through September 15.

C. **Enforcement of Closures**

1. DHEC is the agency responsible for public health protection. This includes public notice and closures of shellfish management areas.

2. District Shellfish Sanitation Program officers shall insure that the area is patrolled at a frequency adequate to prevent illegal harvesting. Documentation of these patrols shall be maintained. District Shellfish Sanitation Program officers may coordinate with other law enforcement officers to insure adequate area coverage.

V. CONTROL ELEMENTS USED TO REOPEN AFTER A POLLUTION EVENT

Opening of areas following closure due to violation of management plan criteria shall adhere to the following control elements.

A. The area shall remain closed for a minimum period of 14 consecutive days following the end of a rainfall event. If, during the initial closure period, a subsequent event occurs that meets the criteria for a closure, the area shall remain closed for 14 consecutive days following the occurrence of the subsequent event.

B. The bacteriological water quality at all stations located within, or on the boundary of, the closed Conditionally Approved area shall be assessed prior to reopening. For the year 2003 report this shall include Stations 18 and 20. The area shall remain closed and be re-sampled at a later date if either sample exceeds a fecal coliform MPN of 43.

C. District Shellfish Sanitation Program staff and the State Shellfish Sanitation Program Manager (or his designee) shall concur on the decision to reopen the area.

D. District Shellfish Sanitation Program staff shall notify SCDNR, Division of Commercial Fisheries Management, of the opening following issuance of the news release.

E. Local Certified Shellfish Shippers shall be notified by SCDHEC of the opening as soon as possible.

F. Map postings shall be updated to reflect the open status.

VI. MANAGEMENT PLAN EVALUATION

This plan shall be evaluated once per year and included as a part of the Shellfish Management Area 15 Annual Update.

Shellfish Management Area 15
EVALUATION OF WALLACE CREEK
CONDITIONAL AREA MANAGEMENT PLAN

July, 2004

I. BACKGROUND INFORMATION

The following is a description of the Wallace Creek Conditionally Approved areas as indicated in the July, 2004 Annual Update:

> *Wallace Creek, the entire tributary, from its confluence with Chowan Creek at Station 15-18 to its headwaters.*

The Wallace Creek area was first classified as Conditionally Approved in the 2000 Annual Update. Most of Wallace Creek is a State Shellfish Ground (S-118) but there is also a Public Shellfish Ground (R-121) near its confluence with Chowan Creek and a Culture Permit (C-119) in the headwaters area.

.

The evaluation period is calendar year 2003. Closure of the Conditionally Approved area was based on rainfall of 1.20" or greater in a 24-hour period. Rainfall is measured at the BJW&SA Southside WWTP.

There are no mariculture activities in this area, therefore, no year-round harvesting takes place.

II. REEVALUATION OF CONDITIONAL CLASSIFICATION

During the shellfish harvest season, there were five (5) rainfall events greater than or equal to 1.20":

Date	Event	Sample Date	Reopening Date
02-17-03	Closed Area – Rainfall (1.40”)	2-25-03	3-07-03
04-09-03	Closed Area- Rainfall (1.26”)	4-21-03	4-22-02
04-25-03	Closed Area- Rainfall (1.34”)	05-05-03	05-08-03
09-06-03	Closed Area- (Rainfall 2.10”)	09-17-03	09-20-03

10-29-03	Closed Area- (Rainfall 2.60")	11-05-03	11-12-03

A. **Compliance -** For the evaluation period, compliance with the Wallace Creek Conditional Management Area plan was satisfactory.

B. **Cooperation -** Cooperation by BJW&SA Southside WWTP personnel in reporting rainfall events has been excellent. WWTP personnel readily supply necessary rainfall data.

C. **Evaluation of Water Quality with Respect to the Bacteriological Standards -** For the Annual Update review period (January 1, 2001 through December 31, 2003) for Shellfish Management Area 15, water quality at Station 20 in Wallace Creek met the statistical criteria for an Approved classification (Table 2(A), Area 15 Annual Update).

For the Annual Update review period, analysis of samples collected at Station 20 in the Wallace Creek Conditional Area while in the Conditional Area Open status (CAO) indicates the station meets the statistical criteria for Approved classification.

FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY
from Conditional Management Area Stations

collected while in Conditional Area Open (CAO) status between January 1, 2001 and December 31, 2003

Station #	20
SAMPLES	19
GEOMEAN	3.3
90TH %ILE	10
WATER QLTY	A
CLASSIFICATION	CA

III. RECOMMENDATIONS

No changes to the boundary of the Wallace Creek Conditional Area are recommended in the 2003 Annual Update. The rainfall action level will be increased, from 1.20 inches to 1.40 inches per 24 hours in the 2004 Annual Update. This action level will be evaluated annually.

Shellfish Management Area 15
BATTERY CREEK
CONDITIONAL AREA MANAGEMENT PLAN

JULY 2004

I. AREA DESCRIPTION

The 2004 Annual Update includes the following written description of Battery Creek's Conditionally Approved area, in addition to a prior and a current classification map defining the Conditionally Approved area boundaries.

> *Battery Creek, from Station 15-24, at the Hwy. 280 (Battery Creek) bridge, to Station 15-21, (excluding all administratively Prohibited closure zones). The Conditionally Approved area also includes stations 10, 25, 26, 27. The portion of the main channel between stations 10 and 19 will be classified as Restricted.*

The Battery Creek area was first classified as Conditionally Approved in the 1997 Annual Update. In January 2001, SCDNR assigned a Culture Permit, C-080, to the area. There have been no changes made to the boundary of the Battery Creek Conditionally Approved area in the 2004 Annual Update. A 410 foot administratively Prohibited closure zone has been placed around Battery Creek Marina.

Prior to May 1997 there were three sample stations (10, 19, and 21) in Battery Creek. In May 1997, sampling began at nine newly created stations in Battery Creek and its tributaries. All nine stations were classified for the first time in the 2000 Annual update.

For the review period (January 1, 2001 through December 31, 2003), all stations in the Battery Creek Conditional Management area, except Station 25, meet the criteria for an Approved water quality classification. Water quality at Station 25 meets the statistical criteria for a Restricted water quality classification. Analysis of samples collected while in the Open status, however, indicates Station 25 meets the statistical criteria for an Approved classification (see data sheets- Conditional Area in Open Status). Therefore, the harvest classification of Station 25 will remain as Conditionally Approved.

There are no mariculture operations in the area; therefore, year round harvesting is not allowed. The harvesting season is from September 16th through May 15th.

II. FACTORS INDICATING SUITABILITY OF BATTERY CREEK AS A CONDITIONALLY APPROVED AREA

A. The major pollution source adversely affecting water quality in Battery Creek is

nonpoint source in origin.

B. Battery Creek receives no substantial freshwater input other than from rainfall and associated runoff.

C. Battery Creek has a tidal range that facilitates sufficient exchange with coastal ocean waters. This exchange results in a typical salinity range of 20 ppt to 28 ppt. Depressed salinities due to rainfall are temporary.

D. Battery Creek is relatively small geographically and does not present major patrol difficulties.

III. PREDICTABLE POLLUTION EVENTS THAT CAUSE CLOSURE

A. Meteorological Events

1. The Battery Creek Conditionally Approved area will be closed upon receipt of 1.20" or more of rainfall in a 24-hour period, as measured at weather station 380559- Beaufort 7 SW, located at the BJW&SA Southside WWTP.

2. Analysis of data excluding samples taken following rainfall events of 1.20" or more in a 24-hour period collected during the shellfish harvesting season (September through May), indicates that stations 10, 21, 24, 25, 26, and 27 will meet the statistical criteria for an Approved classification. This supports management of this area based upon rainfall of 1.20" or more in a 24-hour period. (See data summary table below).

FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY
from Conditional Management Area Stations
collected while in Conditional Area Open (CAO) status
between January 1, 2001 and December 31, 2003

Station #	*10	21	24	25	26	27
SAMPLES	19	19	19	19	19	19
GEOMEAN	3.9	5.7	3.0	7.7	4.8	5.8
90TH %ILE	9	19	6	35	14	16
WATER QLTY	A	A	A	A	A	A
CLASSIFICATION	CA	CA	CA	CA	CA	CA

3. A review of rainfall data for the past five years (1999 to 2003) indicates that the area will receive an average of 3.8 rainfall events per year equal to or greater than 1.20". Although some events are likely to overlap, each event is considered to be separate from the subsequent event by a minimum duration of 14 days. With this in mind, one could expect the Conditionally Approved area in Battery Creek to remain in an open status 78% (179 days) of the harvest season (September 16 through May 15; a total of 242 days).

Number of 24- hour Rainfall events > 1.20 inches Sept. 16 to May 15

1999	5	
2000	3	
2001	0	
2002	7	
2003	4	
Total	19 / 5yrs = 3.8/ yr	3.8 x 14 day closure = 53.2 days closed/yr

53.2 / 242 days in harvest season= 22% closed, 78% open)

B. Seasonal Events

Any significant input from migratory waterfowl populations is offset by tidal flushing.

IV. IMPLEMENTATION OF A CONDITIONAL AREA CLOSURE

The Low Country EQC District Shellfish Sanitation Program manager is the responsible party for determining compliance with all aspects of this plan, including the tracking of rainfall criteria violations. In the event that the manager shall be unavailable, a responsible employee shall be designated responsibility for tracking, compliance, and notification procedures.

A. **Implementation of Closure (September through May):** The following procedures shall be used in the event a closure is necessary:

1. The State Shellfish Sanitation Program Manager (or his designee) shall be notified upon determination of the need for any closure. Media notification shall be coordinated through the Shellfish Sanitation Program and the Office of Media Relations.

2. The Office of Media Relations (Media Relations) is the responsible authority for issuance of news releases. Media Relations shall be notified within four hours of the determination of the need for a closure. They shall be provided with specific information regarding the pollution event and affected area. In the event of the need

for a weekend or holiday closure, Media Relations shall be contacted through their on-call pager number or through the Department's emergency response telephone number.

3. Within four hours of a determination of the need for a closure, District Shellfish staff shall notify the South Carolina Department of Natural Resources (SCDNR), Office of Commercial Fisheries Management, & SCDNR Law Enforcement, by telephone and/or fax.

4. District Shellfish Sanitation Program staff shall notify certified Shellfish Shippers with interests in the affected area. SCDNR is the State agency having authority for the issuance of individual commercial shellfish harvest permits and should provide notification to individual permittees.

5. Prior to September 16, SCDHEC shall post an adequate number of "Warning Conditional Area" signs throughout the area. Additionally, maps indicating the current condition of the affected area will be posted at locations adjacent to the area suitable for public information display. Map postings shall take place immediately following issuance of the draft news release.

6. During the closure period, District Shellfish Sanitation Program officers shall insure patrols are conducted at a frequency sufficient to deter illegal harvest activities. Schedules shall include night and weekend patrols. Documentation of these patrols shall be maintained. Unless a district Shellfish Sanitation Program officer has personal knowledge that a violator has been notified of the closure, under no circumstance shall a summons be issued during the first 48 hours following the initial call to Media Relations. Written warnings should be issued during this 48 hour period and all shellfish should be returned to the water.

B. Management of Conditional Areas Extraneous to the Normal Shellfish Harvest Season

The Wallace Creek Conditionally Approved area shall remain in the closed status from May 16 through September 15.

C. Enforcement of Closures

1. DHEC is the agency responsible for public health protection. This includes public notice and closures of shellfish management areas.

2. District Shellfish Sanitation Program officers shall insure that the area is patrolled at a frequency adequate to prevent illegal harvesting. Documentation of these patrols shall be maintained. District Shellfish Sanitation Program officers may coordinate with other law enforcement officers to insure adequate area coverage.

V. CONTROL ELEMENTS USED TO REOPEN AFTER A POLLUTION EVENT

Opening of areas following closure due to violation of management plan criteria shall adhere to the following control elements.

A. The area shall remain closed for a minimum period of 14 consecutive days following the end of a rainfall event. If, during the initial closure period, a subsequent event occurs that meets the criteria for a closure, the area shall remain closed for 14 consecutive days following the occurrence of the subsequent event.

B. The bacteriological water quality at all stations located within, or on the boundary of, the closed Conditionally Approved area shall be assessed prior to reopening. For the year 2004 report this shall include stations 10, 21, 24, 25, 26, 27 and 28. The area shall remain closed and be re-sampled at a later date if any sample exceeds a fecal coliform MPN of 43.

C. District Shellfish Sanitation Program staff and the State Shellfish Sanitation Program Manager (or his designee) shall concur on the decision to reopen the area.

D. District Shellfish Sanitation Program staff shall notify SCDNR, Division of Commercial Fisheries Management, of the opening following issuance of the news release.

E. Local Certified Shellfish Shippers shall be notified by SCDHEC of the opening as soon as possible.

F. Map postings shall be updated to reflect the open status.

VI. MANAGEMENT PLAN EVALUATION

This plan shall be evaluated once per year and included as a part of the Shellfish Management Area 15 Annual Update.

Shellfish Management Area 15
EVALUATION OF BATTERY CREEK
CONDITIONAL AREA MANAGEMENT PLAN
July, 2004

I. BACKGROUND INFORMATION

The following is a description of the Area 15 Conditionally Approved areas as indicated in the July, 2004 Annual Update:

Battery Creek, from station 15-24 at the Hwy 280 (Battery Creek) bridge to station 15-21, (excluding all administratively Prohibited closure zones). The Conditionally Approved area also includes stations 10, 25, 26, 27. The portion of the main channel between stations 10 and 19 will be classified as Restricted.

This area was first classified as Conditionally Approved in the 1997 Annual Update. The boundary of the Conditionally Approved area was changed in the 2000 Annual Update. In January 2001, SCDNR assigned a Culture Permit, C-080, to the Battery Creek Conditional Management Area. A map indicating the Area 15 Battery Creek Conditionally Approved area boundary is included in the 2004 Annual Reports.

The evaluation period is calendar year 2003. Closure of the Conditionally Approved area was based on rainfall of 1.20" or greater in a 24-hour period. Rainfall is measured at the City of Beaufort WWTP.

There are no mariculture activities in this area, therefore, no year-round harvesting is allowed.

II. REEVALUATION OF CONDITIONAL CLASSIFICATION

During the shellfish harvest season, there were five (5) rainfall events greater than or equal to 1.20":

Date	Event	Sample Date	Reopening Date
02-17-03	Closed Area – Rainfall (1.40”)	2-25-03	3-07-03
04-09-03	Closed Area- Rainfall (1.26”)	4-21-03	4-22-02
04-25-03	Closed Area- Rainfall (1.34”)	05-05-03	05-08-03
09-06-03	Closed Area- (Rainfall 2.10”)	09-17-03	09-20-03
10-29-03	Closed Area- (Rainfall 2.60”)	11-05-03	11-12-03

Compliance - For the evaluation period, the Battery Creek Conditional Management Area was managed in accordance with the plan.

Cooperation - Cooperation by BJW&SA Southside WWTP personnel in reporting rainfall events has been excellent. WWTP personnel readily supply necessary rainfall data.

Evaluation of Water Quality with Respect to the Bacteriological Standards - For the review period (January 1, 2001 through December 31, 2003), all stations in the Battery Creek Conditional Management area, except station 25, meet the criteria for an Approved water quality classification. Water quality at Station 25 meets the statistical criteria for a Restricted water quality classification.

For the review period, analysis of samples collected at stations 10, 21, 24, 25, 25, 26, and 27 in the Battery Creek Conditional Area (while in the Conditional Area Open status - CAO) indicates all stations meet the statistical criteria for an Approved classification.

FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY
from Conditional Management Area Stations
collected while in Conditional Area Open (CAO) status
between January 1, 2001 and December 31, 2003

Station #	*10	21	24	25	26	27
SAMPLES	19	19	19	19	19	19
GEOMEAN	3.9	5.7	3.0	7.7	4.8	5.8
90TH %ILE	9	19	6	35	14	16
WATER QLTY	A	A	A	A	A	A
CLASSIFICATION	CA	CA	CA	CA	CA	CA

III. RECOMMENDATIONS

No changes to the boundary of the Battery Creek Conditional Area are recommended in the 2003 Annual Update. The rainfall action level will remain 1.20 inches per 24 hours. This action level will be evaluated annually.